1.0 INTRODUCTION

The U.S. Department of Energy (DOE) is proposing an action (the Proposed Action) consisting of the construction and operation of the following five site development projects at the National Renewable Energy Laboratory's (NREL) South Table Mountain (STM) site at Golden, Colorado:

- The Energy Systems Integration Facility (ESIF), a new research facility;
- Phase 2 of planned site infrastructure improvements (Phase 2 of Full Site Development);
- A new second full service access road (hereafter referred as the "second access road");
- Expansion of the Waste Handling Facility (WHF); and
- Expansion of the Visitors Center.

In accordance with DOE and National Environmental Policy Act (NEPA) implementing regulations, DOE is required to evaluate the potential environmental impacts of DOE facilities, operations, and related funding decisions. The decision to use federal funds for this Proposed Action requires that DOE address NEPA requirements and related environmental documentation and permitting requirements.

In July 2003, DOE issued the *Final Site-Wide Environmental Assessment of the National Renewable Energy Laboratory's South Table Mountain Complex* (the SWEA) and a Finding of No Significant Impact (FONSI) for proposed site development activities (DOE/EA-1440) (DOE 2003). The SWEA evaluated the impacts that would be associated with long-term buildout of the STM site and the areas suitable for future development. It also identified areas to be set aside and preserved as a conservation easement not subject to future development. As project-specific funding has become available to implement the STM site buildout vision, additional project-specific NEPA analyses have been generated.

In July 2007, DOE issued the *Final Environmental Assessment of Three Site Development Projects at the National Renewable Energy Laboratory South Table Mountain Site* (DOE/EA-1573) (DOE 2007). That environmental assessment (EA) tiered off the SWEA and, for some resource areas, provided updated descriptions of the existing environment at the STM site and impacts expected from the three proposed projects. The July 2007 EA and its associated FONSI are incorporated by reference in their entirety into this ~~draft~~ NEPA document.

In May 2008, DOE issued its first supplement to the SWEA (SWEA/S-I): *Final Supplement to Final Site-wide Environmental Assessment of the National Renewable Energy Laboratory's South Table Mountain Complex, Proposed Construction and Operation of: Research Support Facilities, Infrastructure Improvements (Phase I), Upgrades to the Thermochemical User Facility and Addition of the Thermochemical BioRefinery Pilot Plant* (DOE/EA-1440-S-1) (DOE 2008).

The SWEA and SWEA/S-I provide a detailed framework and an analytical structure under which the potential environmental impacts of the Proposed Action assessed in this second supplement to the SWEA (hereafter referred to as SWEA/S-II) will be evaluated. In compliance with the NEPA (42 U.S.C. 4321) and with DOE's NEPA implementing regulations (10 CFR section 1021.314) and procedures, DOE is examining the potential environmental impacts of the Proposed Action described above. The Proposed Action would be implemented in areas that were analyzed in the SWEA and SWEA/S-I. This supplement tiers off the descriptions of the affected environment and the potential environmental impact assessments presented in the SWEA and the SWEA/S-I.

The SWEA and the SWEA/S-I evaluated the existing and proposed STM site facilities as well as the operation of the site. Implementation of the full site buildout contemplated in the SWEA on 55 hectares (136 acres) of buildable site land would be based on the availability of funds. This SWEA/S-II evaluates

the proposed activities for which funding is currently available or for which the likelihood of securing funding in the near future is high. Additional site development activities identified in the SWEA would be evaluated in future SWEA supplements or other NEPA analyses as funding for them is obtained and as project designs and schedules are further developed. Although this ~~draft~~ SWEA/S-II does not address all potential future site development projects, they have been included under the analyses of cumulative impacts (to the extent that they can be addressed at this time) in accordance with the Council on Environmental Quality (CEQ) and DOE regulations.

The July 2003 SWEA, the July 2007 EA, and the May 2008 SWEA/S-I and their associated FONSIs are available at the NREL Visitors Center and at the DOE Golden Field Office Public Reading Room website at http://www.eere.energy.gov/golden/reading_room.aspx.

This ~~draft~~ SWEA/S-II has been prepared under DOE's regulations and guidelines for compliance with NEPA. It was distributed to interested members of the public and to federal, state, and local agencies for review and comment prior to DOE's final decision on the Proposed Action.

1.1 The National Environmental Policy Act and Related Procedures

CEQ regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508) and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021) require that DOE, as a federal agency:

- assess the environmental impacts of its proposed actions;
- identify any adverse environmental effects that cannot be avoided should a proposed action be implemented;
- evaluate alternatives to the proposed action, including a "no action alternative";
- describe the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- characterize any irreversible and irretrievable commitments of resources that would be involved should the proposed action be implemented.

These requirements must be met before a final decision is made to proceed with any proposed federal action that could cause significant impacts to human health or the environment. This ~~draft~~ SWEA/S-II is intended to meet DOE's regulatory requirements under NEPA ~~and to provide the public, tribes, State of Colorado, and other agencies information to make comments on the draft SWEA/S-II~~.

1.2 Background

NREL History and Research Mission

In July 1977, DOE opened the Solar Energy Research Institute as a federal facility dedicated to harnessing solar power. In 1991, it achieved national laboratory status and was renamed the National Renewable Energy Laboratory (NREL). Today, NREL is one of 10 DOE national laboratories and is the nation's primary laboratory for renewable energy and energy efficiency research and development. NREL's mission is focused on advancing national energy policy and efficiency goals, particularly in the areas of renewable, wind, and solar energy research, development, demonstration, and deployment. NREL conducts research activities at the STM site in support of the following DOE research programs:

- Solar energy technologies
- Geothermal technologies
- Distributed energy, electrical infrastructure, and reliability
- Biomass
- Industrial technologies
- Freedom car and vehicle technology
- Hydrogen, fuel cell, and infrastructure technologies
- Buildings technologies
- Weatherization and intergovernmental grants
- Federal energy management
- Other DOE-sponsored programs
- Work for others supporting the DOE mission

As of October 1, 2008, NREL is operated for DOE by the Alliance for Sustainable Energy, LLC. The laboratory includes three main sites: STM; the adjacent Denver West Office Park (DWOP) in Golden; and the National Wind Technology Center located just south of Boulder, Colorado. The STM and DWOP sites are collectively referred to as the STM complex. The five site development projects that make up the Proposed Action and are the subject of this ~~draft~~ SWEA/S-II would be implemented at the STM site. Figures 1-1 and 1-2 illustrate the regional location and local setting of the STM site and the Proposed Action.

1.3 Purpose and Need

The Proposed Action

The Proposed Action supports and advances DOE's research and development mission in the area of energy efficiency and renewable energy technologies. The goal of this mission is to improve the nation's overall economic strength and competitiveness, energy security, and environmental stewardship through the development, demonstration, and deployment of clean, competitive, and reliable power technologies. The Proposed Action would contribute to achieving this mission. Specifically, the purpose and need of the Proposed Action are to (1) provide additional research and development capabilities at NREL, (2) upgrade and expand portions of the existing infrastructure, including the handling of site-generated wastes, (3) provide additional research and support space for the expanding employee population, (4) alleviate projected traffic congestion associated with future growth, and (5) expand the site's ability to accommodate visitors to NREL.

The additional research and development capabilities ~~at NREL~~ that the ESIF would provide would address several specific technical needs that are critical to the NREL and DOE missions. The federal system currently lacks a facility for and testing engineering-optimized systems, testing integrated energy technologies, and simulating and or emulating new infrastructure scenarios under the control of DOE and available to all of DOE industry partners. The lack of such a facility represents a key barrier in the effort to meet DOE's solar, wind, and hydrogen goals. The proposed ESIF would allow DOE to optimize these technologies as part of a total energy system. Collecting both technical and economic data for business analysis would encourage their integration into energy production and delivery systems at minimum cost and high system reliability. The ESIF would also enable DOE and its industrial partners to assess the potential of solar, wind, and hydrogen technology options for buildings, transportation, communities, and utilities and to develop a validated engineering-scale collection and analysis of performance data for the most promising technologies and integrated energy systems. The ESIF would allow U.S. industry members to insert their

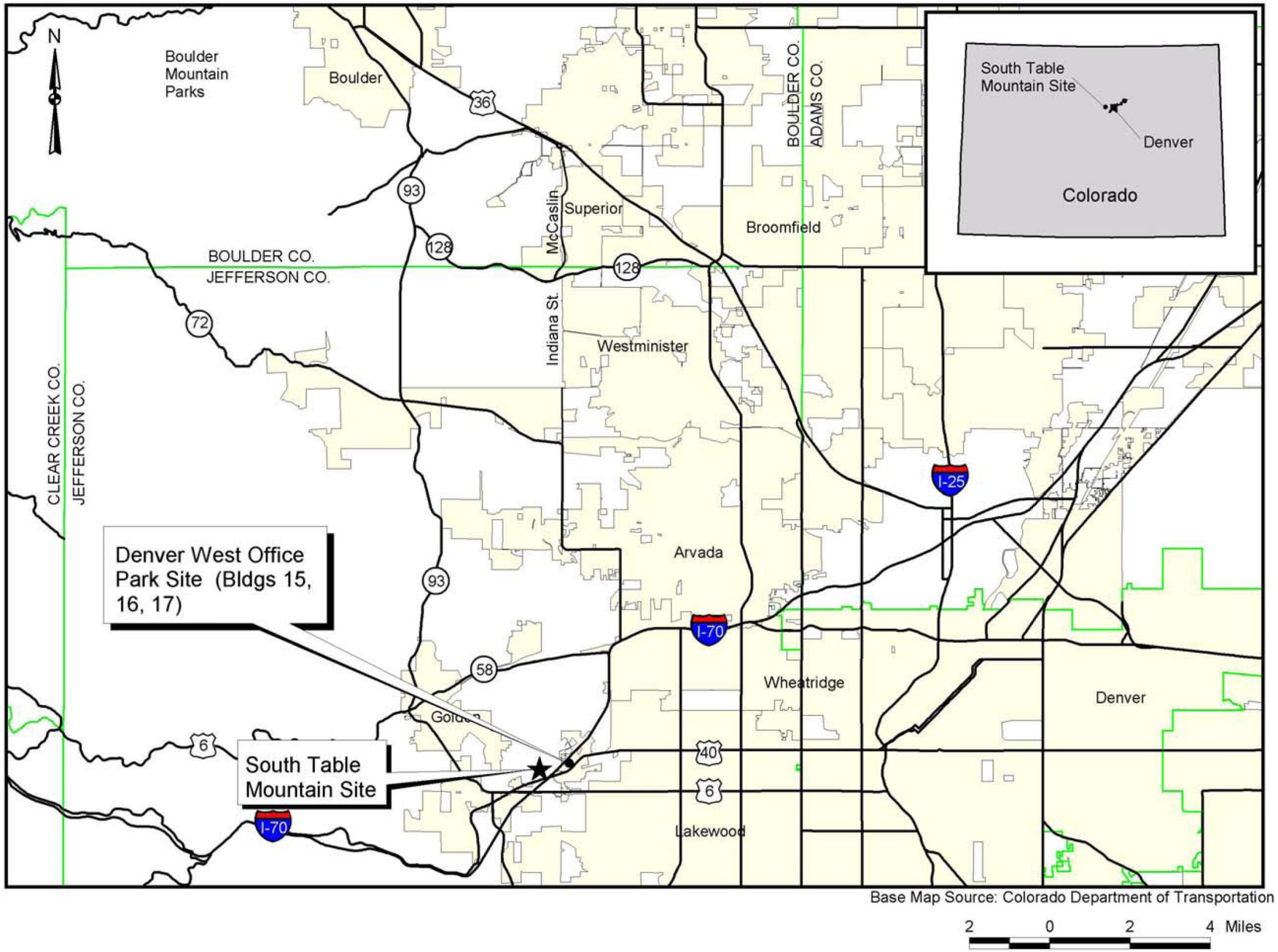

Figure 1-1. Regional Location of the STM Site

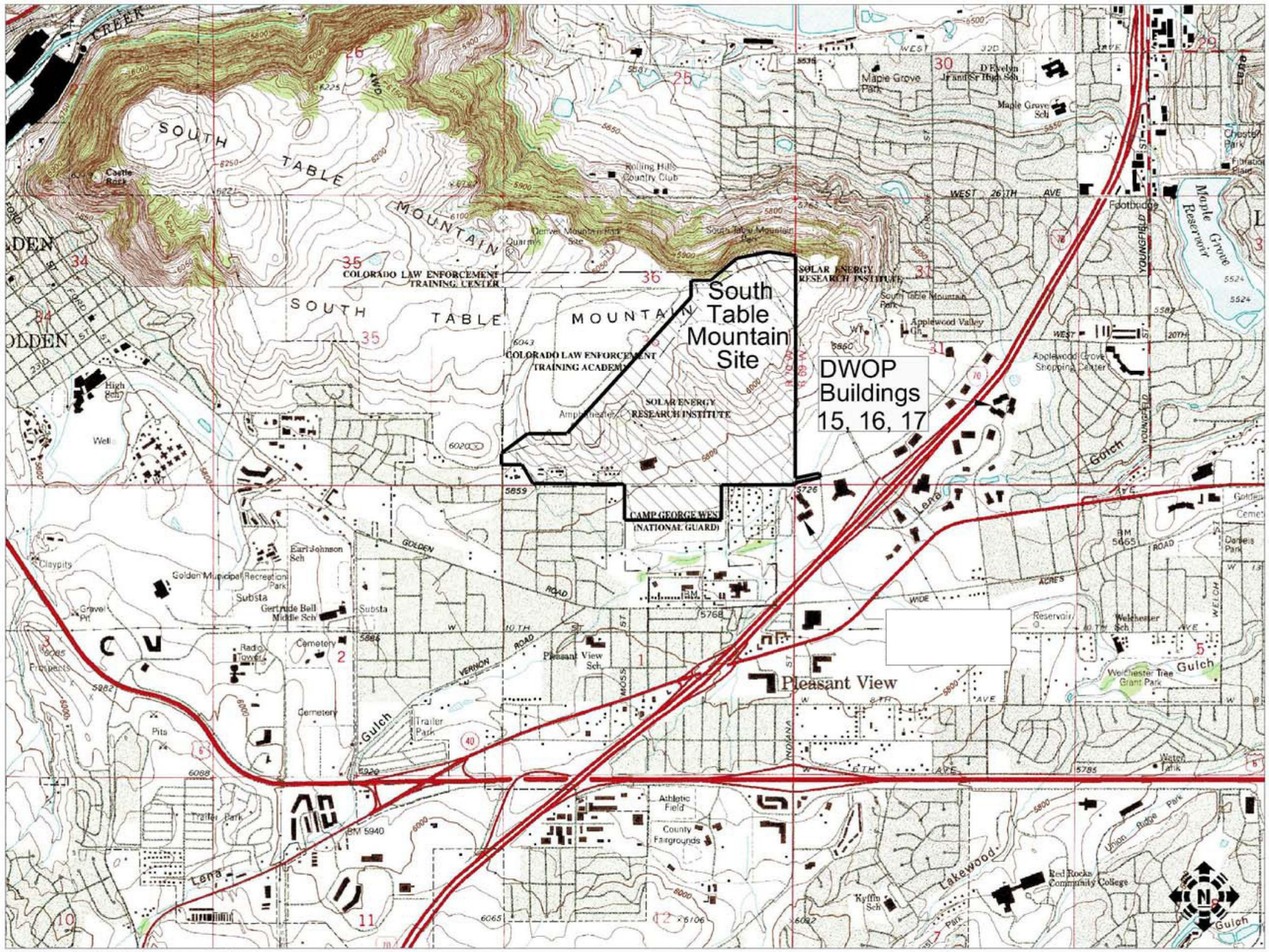

Figure 1-2. Local Setting of the STM Site

individual technologies into a controlled integrated energy system platform to test and optimize the technologies for earlier market penetration. It would also contribute to the ability of the Hydrogen, Fuel Cell & Infrastructure Technologies Program within DOE's Office of Energy Efficiency and Renewable Energy (EERE) to meet its technology readiness milestones.

~~*Draft* *Supplement Environmental Assessment-II*~~

The purpose of this NEPA document is to assess the individual and cumulative potential effects of the five projects that make up the Proposed Action in order to determine if they would pose a significant impact to the human and physical environment. The SWEA (DOE 2003) addressed future site developments, improvements, and on-site activities at the STM complex and future changes associated within the STM site boundaries. It acknowledged that final designs and locations of some proposed or conceptual projects or facilities at the complex were uncertain and that various configurations were possible. The SWEA was prepared as a "bounding" analysis that would allow for future flexibility in implementing a range of potential activities. The bounding approach was used to evaluate potential environmental impacts resulting from an array of potential development options within a conceptually defined "buildout" scenario. The assessment considered a range of future site use and development options. In the FONSI, DOE determined that the proposed or contemplated improvements assessed in the SWEA did not, either individually or collectively, constitute a major federal action significantly affecting the human or physical environment within the meaning of NEPA.

The SWEA (DOE 2003) analyzed impacts that would occur if site development took place in areas that DOE believed would minimize the overall environmental impacts associated with sustainable site development. Moreover, it identified areas that should be set aside and preserved in a natural or existing state. The SWEA assessed specific activities or improvements proposed for implementation at specific site locations or areas. With the exception of the second access road, the proposed projects that are the topic of this ~~draft~~ SWEA/S-II are specific improvements of the type that were analyzed in the SWEA and would occur in areas that were analyzed in the SWEA. DOE concluded in the SWEA ~~(DOE 2003)~~ that development in these areas would not constitute a major federal action significantly affecting the quality of the human environment.

1.4 Scoping

The provisions of NEPA provide the public an opportunity to participate in the environmental review process. In addition, NREL has taken extra measures to maximize public consultation and input during the preparation of this EA. This section describes the steps taken to document that all matters of public interest are considered in this SWEA/S-II.

On September 4, 2008, DOE initiated the scoping process by sending a letter to agencies and the public requesting comments on a suite of proposed activities. Due to program changes and funding availability, DOE's proposed actions have evolved since September 2008; as a result, DOE issued a revised invitation for agency and public comment and held a public meeting on August 6, 2009, to discuss the status of the proposed actions, the characteristics of the five projects, and the nature of environmental issues to be addressed in this SWEA/S- II. It also provided an opportunity for public input regarding environmental concerns in the project area. The meeting was intended to encourage public input into the planning process. Notice letters for the scoping meetings and their distribution lists are found in Appendix A. The comments expressed during the two scoping periods are summarized below in italics; where appropriate, responses to the comment summaries note specific section(s) or chapters within this SWEA/S-II that address the issues raised in the comments.

1. *Commentor requested that consideration be given to establishing a wildlife corridor between Lena Gulch and the top of the mesa to allow deer and other wildlife access to water*. Section 3.1.6 discusses impacts to wildlife.

2. *Commentor requested that the EA evaluate air emissions, specifically particulates, as he suffers from asthma.* Section 3.1.8 describes construction and operational impacts to air quality.

3. *Commentor requested that the EA address safety precautions for the waste handling facility, and expressed concern for the consequences of a fire or terrorist act.* Sections 3.1.10 and 3.1.14 discuss potential impacts associated with waste management and intentional destructive acts under the Proposed Action.

4. *Commentor and nearby neighbor noted that their well water has developed an odor and cloudiness since the recent construction began, and asked that impacts to groundwater be addressed.* Section 3.1.5 discusses impacts to surface water and groundwater.

5. *Commentor asked that other alternatives to a new access road such as bikes, light rail, car pools, telecommuting, etc., be examined first before committing to a new road*. This SWEA/S-II (Section 3.1.2) and the previously prepared EAs for the STM site discuss traffic demand management (TDM) measures that would be implemented to reduce traffic and circulation impacts and explains the need for the new second access road.

6. *Commentor noted that current traffic on South Golden Road is extremely heavy, and dangerous to pedestrians and bicyclists, and therefore DOE should consider upgrades to that route since all new access corridors would put NREL traffic onto South Golden Road.* The traffic analyses generated to support this SWEA/S-II would aid DOE and other agencies in future decision-making regarding needed upgrades to South Golden Road.

7. *Commentor noted that in the past DOE had promised that the West Gate and Quaker Street would only be used in emergencies and other special needs, and not for routine STM traffic.* NEPA requires that all reasonable alternatives be evaluated. ~~Irrespective of any stated or implied previous commitments,~~ Quaker Street is a viable alternative for meeting the needs of a second access road and, therefore, Section 3.1.2 assesses the impacts of utilizing Quaker Street as a potential alternative.

8. *Commentor noted that the developers of Colorado Mills were required to upgrade the roads servicing that facility and that DOE should consider such for the new access road and roads affected by such action.* The project description in Chapter 2 identifies needed roadway upgrades associated with new access corridors.

9. *Commentor was concerned about the Moss Street corridor and the effect on her neighborhood, the wildlife, Lena Gulch, and the gas pipeline*. Potential impacts associated with using Corridor B/C (Moss Street) are assessed throughout Chapter 3. DOE prepared an EA (DOE/EA-1254) that addressed the impacts of constructing and operating the existing gas pipeline prior to its installation (DOE 1998). The second access road corridor selection process would include consideration of the gas pipeline along with numerous other criteria.

10. *Commentor wanted to be sure that the new access corridors did not extend to the mesa top*. *Be assured that the conservation easement prevents development in those areas.* The proposed access corridors described in Chapter 2 do not propose access to the mesa top.

11. *Commentor noted the proximity of homes to several of the corridors.* The relationship of residences to the proposed alternatives for a second access road ~~are~~ is assessed in Chapter 3.

12. *Commentor thought the Isabell Street corridor was a good option*. Comment noted. Corridor E (Isabell) is evaluated throughout Chapter 3 of this SWEA/S-II.

13. *Commentor supported the expansion of the waste handling facility.* Comment noted.

14. *Commentor noted that he can hear, and is disturbed by, exhaust fans at night from the Alternative Fuels User Facility, and requested that noise impacts be included in the EA.* Potential impacts from noise emissions are described in Section 3.1.11.

15. *Commentor noted that there is periodic surface water runoff coming into his neighborhood from the ditch near the Alternative Fuels User Facility during periods when there has been no rain, and noted that there should be no surface discharges from any NREL facility.* Annual hydrostatic testing of fire suppression systems occurs at the various on-site buildings. Approximately 3,800 to 11,400 liters (1,000 to 3,000 gallons) of potable water are used during testing. All test waters are discharged to Lena Gulch via NREL's existing stormwater conveyance systems, which exit the site at the western, middle, and eastern portions of the site. Additionally, twice a year, Consolidated Mutual's 2-million-gallon tank on top of STM is flushed when the tank's contents are low, releasing about 30,000 to 50,000 gallons of water; that water is discharged into the stormwater system.

16. *Commentor noted that the area is very pedestrian and bicyclist unfriendly and asked that a pathway allowing pedestrian and bicycle access across the STM site be provided.* ~~Any new road construction would include sidewalks, and DOE would consider bike paths in its decision-making. However, at this time, site-wide public access is not being considered.~~ The second full service site access design considers pedestrian and bicycle access in Section 2.2.

17. *Commentor noted that DOE had promised in past meetings that new buildings would not exceed 2 stories and that the new construction was exceeding that height.* Section 3.1.4 assesses potential impacts to sensitive visual receptors. DOE acknowledges that site development activities have the potential to impact views of the foothills and surrounding communities and strives to minimize these impacts.

18. *Commentor thought that a diagram displayed at the scoping meeting was in error locating the natural gas pipeline and that the parking garages as plotted were actually over the gas pipeline.* Parking garages are not proposed to be built over the subject gas pipeline.

19. *Commentor was concerned about all of the pollution that would be brought to the site by the new staff vehicles.* Section 3.1.8 describes construction and operational impacts to air quality.

20. *Commentor noted that several of the proposed new structures are too close to the neighborhood*. The analyses in Chapter 3 of this SWEA/S-II consider the proximity of the neighborhoods in assessing impacts.

21. *Commentor noted that Quaker Street had speed bumps which are successful in keeping speeds to 25 mph, and that the speed bumps should not be removed*. Chapter 3 of this SWEA/S-II assesses the impacts of utilizing Quaker Street a potential alternative.

22. *Commentor was concerned that there are many individuals and organizations with involvement in several of the corridors (e.g., private land owners, USFWS, USACEOE, County) and that it would be difficult consulting with all of those people*. DOE and NREL are actively involved in discussions with all potentially affected parties and agencies with regulatory authority relative to decision-making on the alternative corridors.

23. *Commentor noted that Old Golden Road and many of the other roads in the area are already overloaded.* This SWEA/S-II (Section 3.1.2) and the previously prepared EAs for the STM site discuss potential traffic impacts and circulation effects from the STM site.

24. *Commentor asked how DOE had considered previous comments.* DOE maintains records of all comments received during the NEPA process and takes those comments into consideration in its decision-making.

25. *Commentor asked that moving to another site be considered for NREL's buildout*. The alternative of relocating NREL is considered infeasible and has not been considered as a viable alternative.

26. *Commentor noted that there are rumors that DOE is planning to annex the Richards Heights neighborhood.* There are no plans being considered by NREL or DOE to annex the Richards Heights subdivision.

27. *Commentor was concerned about the impacts of lighting the parking lots*. Refer to Section 3.1.4 for an assessment on light and glare.

28. *Commentor was concerned about the impacts, such as noise and traffic, from employees working late hours.* Noise and traffic impacts associated with the Proposed Action are described in Sections 3.1.11 and 3.1.2, respectively.

29. *Commentor was concerned about the effect the expansion of the STM site might have on property values.* The positive or negative effects that site development might have on property values ~~is~~ are beyond the scope of this SWEA/S-II.

30. *One commentor asked for the location of the proposed second entrance road*. The alternative corridors that are evaluated by DOE are detailed on Figure 2-4 of this SWEA/S-II.

31. *Jefferson County Open Space (JCOS), which has ownership and easement rights adjacent to the NREL STM site at the Pleasant View Community Park and the STM open space park, requested that DOE consider granting JCOS administrative access through a new south entrance, and that the expansion of the Visitors Center and any new parking capacity consider the public's access to the trail system to STM and utilization of the Pleasant View Community Park.* In this SWEA/S II, DOE evaluates the environmental impacts of constructing and operating a new second access road within one of five alternative corridors and assesses the consequences of additional parking developed to meet anticipated growth at the STM site. In addition to the information provided by this SWEA/S-II, DOE would consider a range of options for administrative and public use of a new access road and parking in its final decision-making and anticipates further discussions with JCOS on these subjects before making its decision.

1.5 Organization of this SWEA/S-II

The five projects that make up the Proposed Action assessed in this SWEA/S-II are described in detail in Chapter 2. The affected environment within which these actions would occur, and the impacts that would result if implemented, are characterized in Chapter 3. The cumulative impacts of these actions and others are assessed in Chapter 4, and the commitment of resources is discussed in Chapter 5. Chapter 6 lists references cited.

In addition, ~~four~~ five appendices provide information pertaining either to the NEPA process or to the analyses in this SWEA/S-II. Appendix A contains notice letters and distribution lists for the scoping periods. Appendix B provides correspondence relating to agency consultations. A detailed bounding events analysis for the proposed ESIF is contained in Appendix C, and Appendix D describes the Camp George West Historic District, a Colorado Army National Guard installation with historic resources that could potentially be affected under the Proposed Action. Appendix E contains comments on the draft version of this SWEA/S-II and provides DOE's responses to those comments.